

REMARKS

Present Status of the Application

The Applicant is pleased to acknowledge that the Office Action dated December 4, 2002 allowed claims 1-8. Notwithstanding, claims 9-12 and 14 stand rejected under 35 USC 102(b) as being anticipated by Gaynes et al. (US Patent No. 6,165,885), and claims 13 and 15 were rejected under 35 USC 103(a) as being unpatentable over the same Gaynes et al in view of the admitted prior art.

The remarks set forth in the Office Action have been carefully considered. Claim 9 has been amended to patently distinguish over the cited reference, and new claim 16 has been added. Furthermore, the specification has been amended to correct a minor typographical informality. It is believed that no new matter has been introduced by ways of the present amendment. In view of the above amendment and following remarks, the Applicant earnestly solicits the reconsideration and allowance of all the pending claims.

Discussion of the Office Action Rejections

Claim rejection under 35 USC 102

The Office Action rejected claims 9-12 and 14 under 35 USC 102(b) as being anticipated by Gaynes et al. In view of the set forth amendment, this rejection is respectfully traversed.

As described in amended claim 9 (and FIGS. 8 through 13), the process of the invention forms a plurality of conductive paste plugs respectively in the open windows of an insulation layer. Thereafter, *a patterned metallic layer is formed over the insulation layer in electrical connection with the conductive paste plug. The patterned metallic layer forms at least a ball*

pad that is thereby electrically connected to the conductive paste plug (new claim 16).

Gaynes et al. neither discloses nor hints the above-emphasized feature. As illustrated in FIGS. 76 and 77, Gaynes et al. deposits a solder paste 1507 in holes of a stencil 1505. The solder paste 1507 then is reflowed to form solder balls 1509. Clearly, Gaynes et al. teaching directs to the formation of solder balls and fails to disclose or suggest *form a patterned metallic layer over the insulation layer in electrical connection with the conductive paste plug*, in the manner described in the claim.

For at least the above reasons, it is submitted that amended claim 9 should patently distinguish over the cited reference.

With respect to claim 14, Gaynes et al. not only fails to disclose the above-discussed features of claim 9, but further is deficiently silent about a plurality of bumps inside the open windows of the insulation layer.

By virtue of their dependency upon claim 9, it is submitted that claims 10-12 are also patentable.

Claim rejection under 35 USC 103

The Office Action rejected claims 13 and 15 under 35 USC 103(a) as being unpatentable over Gaynes et al. in view of the admitted prior art. This rejection is respectfully traversed.

Gaynes et al. is as discussed above. On the other hand, it is acknowledged that the admitted prior art may specifically teach form open windows by laser drilling and the substrate include a redistribution layer. However, the admitted prior art still substantially fails to teach or suggest the invention as recited in patentable amended claim 9, and even if combined with Gaynes et al. would have been deficient to meet the limitations as recited in claim 9. By virtue

of their respective dependency upon claim 9, claims 13, 15 therefore should also be patentable over the relied prior art.

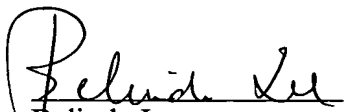
New claim 16 further describes the patterned metallic layer forms a ball pad that is electrically connected to the conductive paste plug, which is neither taught nor hinted in Gaynes et al.

CONCLUSION

For at least the foregoing reasons, it is believed that claims 9-16, like allowed claims 1-8 of the present application, patently define over the prior art and are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

Date : Feb 11, 2003


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VERSION WITH MARKED-UP AMENDMENT

In The Specification

The specification has been amended as follows.

[0036] In conclusion, the invention at least has the following advantages:

1. Since each bump is surrounded by conductive paste, electric current is able to pass from the bump to the solder ball via the [glue] conductive paste. Because conductive paste has good extensibility, thermal stress caused by deformation between the chip and the circuit board caused by heat is annulled. Hence, contact failure due to bump breakage in a conventional package design is entirely avoided.

2. The final cutout package has a relatively small volume, and the sectional area of the package is almost identical to the sectional area of the chip. Moreover, the bumps are enclosed inside the open windows of the insulation layer so that overall thickness of the package is reduced.

3. The wafer level package structure and manufacturing procedure can reduce the production cost.

In The Claims

The claims have been amended as follows.

9. (Once amended) A process of forming an insulation layer having a plurality of conductive paste plugs therein over a wafer, comprising the steps of:

providing a wafer having a plurality of chips therein, wherein the wafer has an active side;

forming an insulation layer over the active side of the wafer;

forming a plurality of open windows in the insulation layer; [and]

forming a plurality of conductive paste plugs, wherein each of the conductive paste plug is inside the respective open window; and

forming a patterned metallic layer over the insulation layer in electrical connection with at least one conductive paste plug.